CLAIMS

1. A method for encoding video data, comprising the steps of:

dividing an image into blocks, each block including a plurality of pixels,

transforming the pixels of a block into transform coefficients (W), and

quantizing the transform coefficients (W) in accordance with predefined quantization intervals by mapping each coefficient value to a quantized coefficient value

characterized in that

the size of the quantization interval of the lowest coefficient values is adjusted in accordance with a variable dead-zone parameter (Θ), and

the applied dead-zone parameter (Θ) is included into the encoded video data for a corresponding modification of the quantization interval of the lowest coefficient values at the decoder side.

2. A method according to claim 1, wherein the size of said quantization intervals is adjusted in accordance with a rounding control parameter (f), said rounding control parameter (f) being not part of said encoded video data.

3. A method according to claim 1 or 2, wherein said dead-zone parameter (Θ) having a size between a fifth and a half of the interval step size.

4. A method according to any of claims 1 to 3, wherein said dead-zone parameter (Θ) having a size of approximately 1/4 of the interval size.

5. A method according to any of claims 1 to 4, wherein said dead-zone parameter (Θ) being updated every field or frame of a video sequence.

6. A method according to any of claims 1 to 4, wherein said dead-zone parameter (Θ) being updated once per video sequence to be encoded or for every predefined sub-sequences thereof.

7. A method according to any of claims 1 to 6, wherein said video data are encoded based on I, P or B type macroblocks and different said dead-zone parameters (Θ) are employed for each macroblock type.

8. A method according to any of claims 1 to 7, wherein said method further comprises the steps of:

detecting a degree or the presence of film grain within the video data to be encoded, and

adapting the size of said dead-zone parameter in accordance with the detection result.

9. A method according to any of claims 1 to 7, wherein said method further comprises the steps of:

detecting the presence of film grain within the video data to be encoded, and

enabling the application of said dead-zone parameter only if film grain has been detected.

10. A method according to any of claims 1 to 9, wherein said method further comprises the step of predicting the block to be encoded based on a previously encoded block wherein said prediction step comprises a decoding step including an inverse quantization step which applies said dead-zone parameter for the de-quantization.

11. An encoder for encoding video data based on image blocks, each block including a plurality of pixels, comprising:

a transformer (120) for transforming the pixels of a block into transform coefficients, and

a quantizer (120) for quantizing the coefficients in accordance with predefined quantization intervals by mapping each coefficient value to a quantized coefficient value

characterized in that

the size of the quantization interval of the lowest coefficient values being adjustable in accordance with a variable dead-zone parameter (Θ), and

the applied dead-zone parameter (Θ) being included into the encoded video data for a corresponding modification of the quantization interval of the lowest coefficient values at the decoder side.

12. An encoder according to claim 11, wherein the size of said quantization intervals being adjustable in accordance with a rounding control parameter (f), said rounding control parameter (f) being not part of said encoded video data.

13. An encoder according to claim 11 or 12, wherein said dead-zone parameter (Θ) having a size between a fifth and a half of the interval size.

14. An encoder according to any of claims 11 to 13, wherein said dead-zone parameter (Θ) having a size of approximately 1/4 of the interval size.

15. An encoder according to any of claims 11 to 14, wherein said dead-zone parameter (Θ) being updated every field or frame of a video sequence.

16. An encoder according to any of claims 11 to 14, wherein said dead-zone parameter (Θ) being updated once per video sequence to be encoded or for every predefined sub-sequences thereof.

17. An encoder according to any of claims 11 to 16, wherein said video data being encoded based on I, P or B type macroblocks and different said dead-zone parameters (Θ) being employed for each macroblock type.

18. An encoder according to any of claims 11 to 17, further comprising:

a detector for detecting a degree or the presence of film grain within the video data to be encoded, and

setting means for adapting the size of said dead-zone parameter in accordance with the detection result.

19. An encoder according to any of claims 11 to 17, further comprising:

a detector for detecting the presence of film grain within the video data to be encoded, and

enabling means for enabling the application of said dead-zone parameter only if film grain has been detected.

20. An encoder according to any of claims 11 to 19, wherein said encoder being a predictive encoder and further comprises a decoder for decoding the

encoded video data, said decoding including a de-quantizer for applying said dead-zone parameter during de-quantization.

21. A method for decoding encoded video data on a block basis, said encoded video data include quantized coefficients, comprising the steps of:

de-quantizing a block of quantized coefficients of said encoded video data by mapping each quantized coefficient value to a de-quantized coefficient value in accordance with predefined de-quantization intervals, and

transforming a block of de-quantized coefficients into a block of pixels,

characterized in that

the size of the de-quantization interval of the lowest coefficient values is adjusted in accordance with a variable dead-zone parameter (Θ).

22. A method according to claim 21, wherein said dead-zone parameter (Θ) having a size between a fifth and a half of the interval step size.

23. A method according to claim 21 or 22, wherein said dead-zone parameter (Θ) having a size of approximately 1/4 of the interval size.

24. A method according to any of claims 21 to 23, wherein said dead-zone parameter (Θ) being updated every field or frame of a video sequence.

25. A method according to any of claims 21 to 24, wherein said video data being encoded as I, P or B type macroblocks, each macroblock having a different said dead-zone parameter (Θ).

26. A method according to any of claims 21 to 25, wherein said dead-zone parameter (Θ) being part of said encoded video data.

27. A decoder for decoding encoded video data on a block basis, said encoded video data include quantized coefficients, comprising:

an inverse quantizer (220) for de-quantizing a block of quantized coefficients of said encoded video data by mapping each quantized coefficient value to a de-quantized coefficient value in accordance with predefined de-quantization intervals, and

an inverse transformer (220) for transforming a block of de-quantized coefficients into a block of pixels,

characterized in that

the size of the de-quantization interval of the lowest coefficient values is adjusted in accordance with a variable dead-zone parameter (Θ).

28. A decoder according to claim 27, wherein said dead-zone parameter (Θ) having a size between a fifth and a half of the interval step size.

29. A decoder according to claim 27 or 28, wherein said dead-zone parameter (Θ) having a size of approximately 1/4 of the interval size.

30. A decoder according to any of claims 27 to 29, wherein said dead-zone parameter (Θ) being updated every field or frame of a video sequence.

31. A decoder according to any of claims 27 to 30, wherein said video data being encoded as I, P or B type macroblocks, each macroblock having a different said dead-zone parameter (Θ).

32. A decoder according to any of claims 27 to 31, wherein said dead-zone parameter (Θ) being part of said encoded video data.